OPERATOR'S MANUAL

DieHard®

6V/12V Battery Charger & Engine Starter

Model No.
28.71234

⚠CAUTION

Read and follow all Safety Rules and Operating Instructions before Every Use of this Product.

SAVE THESE INSTRUCTIONS.

Sears Brands Management Corporation, Hoffman Estates, IL 60179 U.S.A.

00-99-001013/0510

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DIEHARD THREE-YEAR FULL WARRANTY

When operated and maintained according to all supplied instructions, if this DieHard product fails due to a defect in material or workmanship within 3 years from the date of purchase, return it to any DieHard outlet in the United States for free replacement.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Sears Brands Management Corporation, Hoffman Estates, IL 60179

FOR CUSTOMER ASSISTANCE OR REPLACEMENT PARTS,
CALL TOLL-FREE FROM 7 AM TO 5 PM CT
MONDAY THROUGH FRIDAY: 1-800-732-7764

IMPORTANT: READ AND SAVE THIS SAFETY AND INSTRUCTION MANUAL.

SAVE THESE INSTRUCTIONS – The 71234 offers a wide range of features to accommodate your needs. This manual will show you how to use your charger safely and effectively. Please read, understand and follow these instructions and precautions carefully, as this manual contains important safety and operating instructions. The safety messages used throughout this manual contain a signal word, a message and an icon.

The signal word indicates the level of the hazard in a situation.

⚠DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or bystanders.

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or bystanders.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in moderate or minor injury to the operator or bystanders.

IMPORTANT Indicates a potentially hazardous situation which, if not avoided, could result in damage to the equipment or vehicle or property damage.

Safety messages in this manual contain two different sentence styles.

- Unnumbered sentences state the hazard.
- Numbered sentences state how to avoid the hazard.

The icon gives a graphical description of the potential hazard.

⚠WARNING

Pursuant to California Proposition 65, this product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

1. IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS -
This manual contains important safety and operating instructions

RISK OF ELECTRIC SHOCK OR FIRE.

1.1 Keep out of reach of children.

1.2 Do not expose the charger to rain or snow.

1.3 Use only recommended attachments. Use of an attachment not recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock or injury to persons or damage to property.

1.4 To reduce the risk of damage to the electric plug or cord, pull by the plug rather than the cord when disconnecting the charger.

1.5 An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure:

- That the pins on the plug of the extension cord are the same number, size and shape as those of the plug on the charger.
- That the extension cord is properly wired and in good electrical condition.
- That the wire size is large enough for the AC ampere rating of the charger as specified in section 8.

1.6 To reduce the risk of electric shock, unplug the charger from the outlet before attempting any maintenance or cleaning. Simply turning off the controls will not reduce this risk.

1.7 Do not operate the charger with a damaged cord or plug; have the cord or plug replaced immediately by a qualified service person. (Call customer service at: 1-800-732-7764.)

1.8 Do not operate the charger if it has received a sharp blow, been dropped or otherwise damaged in any way; take it to a qualified service person. (Call customer service at: 1-800-732-7764.)

1.9 Do not disassemble the charger; take it to a qualified service person when service or repair is required. Incorrect reassembly may result in a risk of fire or electric shock. (Call customer service at: 1-800-732-7764.)

RISK OF EXPLOSIVE GASES.

1.10 WORKING IN THE VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT YOU FOLLOW ALL INSTRUCTIONS IN THIS MANUAL EACH TIME YOU USE THE CHARGER.

1.11 To reduce the risk of a battery explosion, follow all instructions in this manual and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of the battery. Review the cautionary markings on these products and on the engine.

2. PERSONAL PRECAUTIONS

RISK OF EXPLOSIVE GASES.

2.1 NEVER smoke or allow a spark or flame in the vicinity of a battery or engine.

2.2 Remove personal metal items such as rings, bracelets, necklaces and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.

2.3 Be extra cautious to reduce the risk of dropping a metal tool onto the battery. It might spark or short-circuit the battery or other electrical part that may cause an explosion.

2.4 Use this charger for charging LEAD-ACID batteries only. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use this battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.

2.5 NEVER charge a frozen battery.

2.6 NEVER overcharge a battery.

2.7 Consider having someone close enough by to come to your aid when you work near a lead-acid battery.

2.8 Have plenty of fresh water and soap nearby in case battery acid contacts your skin, clothing or eyes.

2.9 Wear complete eye and body protection, including safety goggles and protective clothing. Avoid touching your eyes while working near the battery.

2.10 If battery acid contacts your skin or clothing, immediately wash the area with soap and water. If acid enters your eye, immediately flood the eye with cold running water for at least 10 minutes and get medical attention right away.

2.11 If battery acid is accidentally swallowed, drink milk, the whites of eggs or water. DO NOT induce vomiting. Seek medical attention immediately.

3. PREPARING TO CHARGE

RISK OF CONTACT WITH BATTERY ACID. BATTERY ACID IS A HIGHLY CORROSIVE SULFURIC ACID.

3.1 If it is necessary to remove the battery from the vehicle to charge it, always remove the grounded terminal first. Make sure all of the accessories in the vehicle are off to prevent arcing.

3.2 Be sure the area around the battery is well ventilated while the battery is being charged.

3.3 Clean the battery terminals before charging the battery. During cleaning, keep airborne corrosion from coming into contact with your eyes, nose and mouth. Use baking soda and water to neutralize the battery acid and help eliminate airborne corrosion. Do not touch your eyes, nose or mouth.

3.4 Add distilled water to each cell until the battery acid reaches the level specified by the battery manufacturer. Do not overfill. For a battery without removable cell caps, such as valve regulated lead acid batteries (VRLA), carefully follow the manufacturer's recharging instructions.

3.5 Read, understand and follow all instructions for the charger, battery, vehicle and any equipment used near the battery and charger. Study all of the battery manufacturer's specific precautions while charging and recommended rates of charge.

3.6 Determine the voltage of the battery by referring to the vehicle owner's manual and make sure that the output voltage selector switch is set to the correct voltage. If the charger has an adjustable charge rate, charge the battery in the lowest rate first.

3.7 Make sure that the charger cable clips make tight connections.

4. CHARGER LOCATION

RISK OF EXPLOSION AND CONTACT WITH BATTERY ACID.

4.1 Locate the charger as far away from the battery as the DC cables permit.

4.2 Never place the charger directly above the battery being charged; gases from the battery will corrode and damage the charger.

4.3 Do not set the battery on top of the charger.

4.4 Never allow battery acid to drip onto the charger when reading the electrolyte specific gravity or filling the battery.

4.5 Do not operate the charger in a closed-in area or restrict the ventilation in any way.

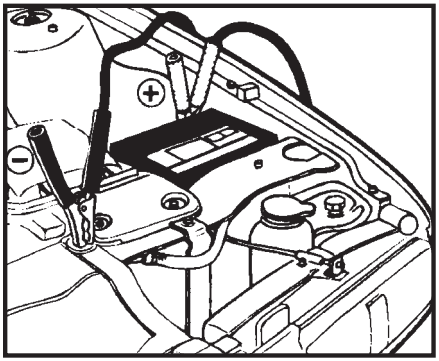
5. DC CONNECTION PRECAUTIONS

5.1 Connect and disconnect the DC output clips only after setting all of the charger switches to the "off" position (if applicable) and removing the AC plug from the electrical outlet. Never allow the clips to touch each other.

5.2 Attach the clips to the battery and chassis, as indicated in sections 6 and 7.

6. FOLLOW THESE STEPS WHEN BATTERY IS INSTALLED IN VEHICLE

A SPARK NEAR THE BATTERY MAY CAUSE A BATTERY EXPLOSION. TO REDUCE THE RISK OF A SPARK NEAR THE BATTERY:



NEGATIVE GROUNDED SYSTEM

6.1 Position the AC and DC cables to reduce the risk of damage by the hood, door and moving or hot engine parts. NOTE: If it is necessary to close the hood during the charging process, ensure that the hood does not touch the metal part of the battery clips or cut the insulation of the cables.

6.2 Stay clear of fan blades, belts, pulleys and other parts that can cause injury.

6.3 Check the polarity of the battery posts. The POSITIVE (POS, P, +) battery post usually has a larger diameter than the NEGATIVE (NEG, N, -) post.

6.4 Determine which post of the battery is grounded (connected) to the chassis (vehicle frame). If the negative post is grounded to the chassis (as in most vehicles), see step 6.5. If the positive post is grounded to the chassis, see step 6.6.

6.5 For a negative-grounded vehicle, connect the POSITIVE (RED) clip from the battery charger to the POSITIVE (POS, P, +) ungrounded post of the battery. Connect the NEGATIVE (BLACK) clip to the vehicle frame or engine block at a distance away from the battery. Do not connect the clip to the carburetor, fuel lines or sheet-metal body parts. Connect to a heavy gauge metal part of the vehicle frame or engine block.

6.6 For a positive-grounded vehicle, connect the NEGATIVE (BLACK) clip from the battery charger to the NEGATIVE (NEG, N, -) ungrounded post of the battery. Connect the POSITIVE (RED) clip to the vehicle frame or engine block at a distance away from the battery. Do not connect the clip to the carburetor, fuel lines or sheet-metal body parts. Connect to a heavy gauge metal part of the vehicle frame or engine block.

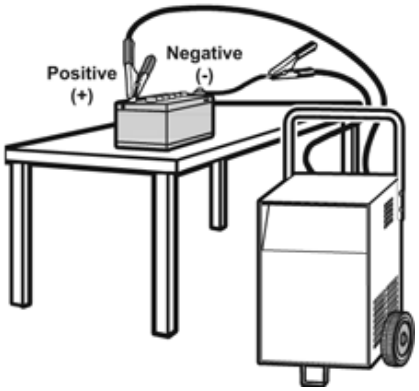
6.7 Connect charger AC supply cord to electrical outlet.

6.8 When disconnecting the charger, turn all switches to off, disconnect the AC cord, remove the clip from the vehicle chassis and then remove the clip from the battery terminal.

6.9 See CALCULATING CHARGE TIME for length of charge information.

7. FOLLOW THESE STEPS WHEN BATTERY IS OUTSIDE VEHICLE

A SPARK NEAR THE BATTERY MAY CAUSE A BATTERY EXPLOSION. TO REDUCE THE RISK OF A SPARK NEAR THE BATTERY:



7.1 Check the polarity of the battery posts. The POSITIVE (POS, P, +) battery post usually has a larger diameter than the NEGATIVE (NEG, N, -) post.

7.2 Attach at least a 24-inch (61 cm) long 6-gauge (AWG) insulated battery cable to the NEGATIVE (NEG, N, -) battery post.

7.3 Connect the POSITIVE (RED) charger clip to the POSITIVE (POS, P, +) post of the battery.

7.4 Position yourself and the free end of the cable you previously attached to the NEGATIVE (NEG, N, -) battery post as far away from the battery as possible – then connect the NEGATIVE (BLACK) charger clip to the free end of the cable.

7.5 Do not face the battery when making the final connection.

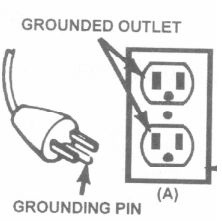
7.6 Connect charger AC supply cord to electrical outlet.

7.7 When disconnecting the charger, always do so in the reverse order of the connecting procedure and break the first connection while as far away from the battery as practical.

7.8 A marine (boat) battery must be removed and charged on shore. To charge it onboard requires equipment specially designed for marine use.

8. GROUNDING AND AC POWER CORD CONNECTIONS

RISK OF ELECTRIC SHOCK OR FIRE.



8.1 This battery charger is for use on a nominal 120-volt circuit and has a grounded plug that looks like the plug illustrated. The charger must be grounded to reduce the risk of electric shock. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances. The plug pins must fit the receptacle (outlet). Do not use with an ungrounded system.

8.2 **DANGER** Never alter the AC cord or plug provided – if it does not fit the outlet, have a proper grounded outlet installed by a qualified electrician. An improper connection can result in a risk of an electric shock or electrocution. **NOTE**: Pursuant to Canadian Regulations, use of an adapter plug is not allowed in Canada. Use of an adapter plug in the United States is not recommended and should not be used.

8.3 Recommended minimum AWG size for extension cord:

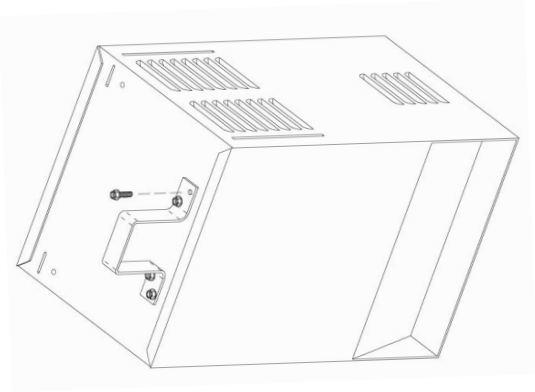
- 100 feet long or less - use a 10 gauge extension cord.
- Over 100 feet long - use an 8 gauge extension cord.

9. ASSEMBLY INSTRUCTIONS

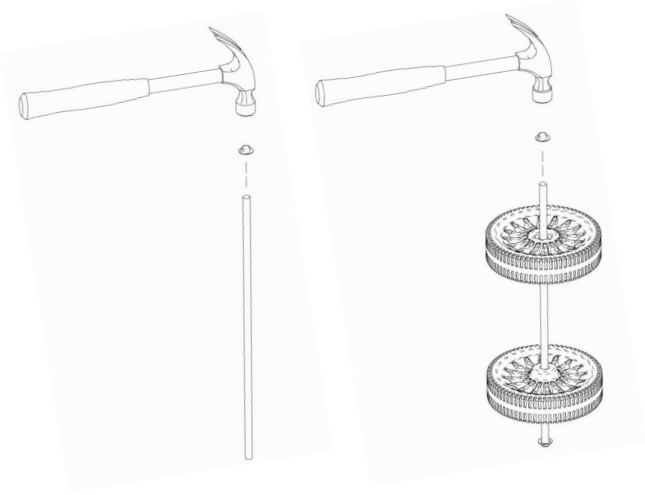
9.1 It is important to fully assemble your charger before use. Remove all cord wraps and uncoil the cables prior to using the battery charger. Follow these instructions for assembly.

PARTS	TOOLS NEEDED
(2) 10-32, thread cutting screws	3/8” wrench (for mounting foot)
(4) ¼-20, thread cutting screws	5/16” wrench (for mounting wheels)
(2) wheels	1/4” wrench (for mounting handle)
(1) axle	hammer
(2) axle caps	screwdriver (flat blade)
(2) axle brackets	screwdriver (Phillips)
(1) handle	
(1) foot	

9.2 **Attach the Foot:** Remove the charger from the packing materials and lay it on it's side on a flat surface. Attach the foot and secure it with the four ¼-20 thread cutting screws provided.

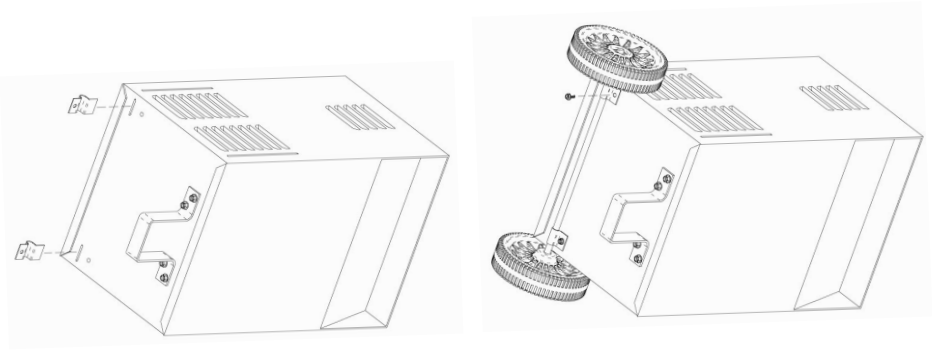


9.3 **Assemble the Wheels and Axle**: Hold the axle upright on the floor or work surface. Then, using a hammer, tap one of the axle caps onto the top end of the axle. Be sure to tap the axle cap on straight. Slide both wheels onto the axle with the recessed hubs facing out as shown. Install the second axle cap.

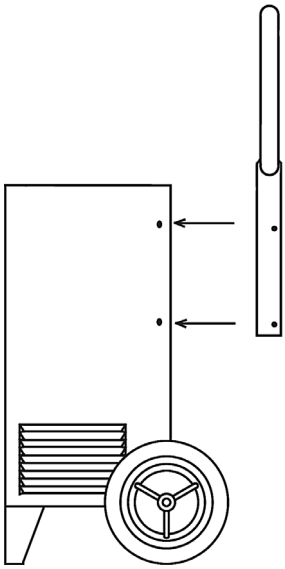


9.4 **Mount the Axle to the Charger**: Place one end of each bracket into the slot on the bottom of the charger. Place the axle assembly under each bracket. Attach the brackets using the two, 10-32 thread cutting screws provided.

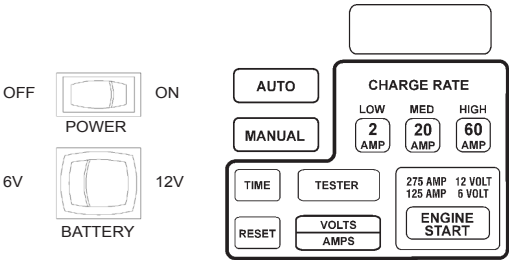
NOTE: Be careful not to drop the brackets inside of the charger case.

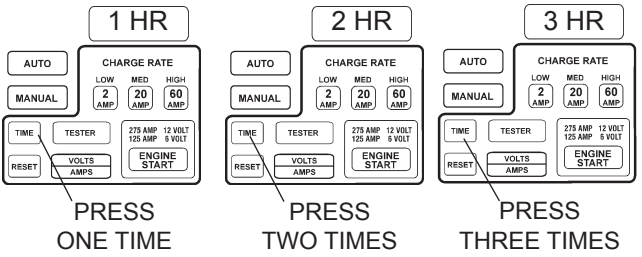


9.5 **Attach the Handle**: Remove the two top screws from each side of the charger. Align the handle so the screw holes are aligned with the screw holes on each side of the charger. Attach the handle using the same screws you previously removed.



10. FEATURES/CONTROL PANEL





TOUCH "TIME" PAD TO ADD INCREMENTS

RATE	2 Amps	20 Amps	60 Amps
Maximum Time	18 Hours	10 Hours	5 Hours
Increment Settings	1 Hour	1 Hour	½ Hour

Setting the Controls
All controls for your charger are located on the front of the unit. Follow these instructions to obtain the accurate charge level for your battery.

Power On/Off Switch
Make sure your charger is OFF when connecting or disconnecting it from the vehicle and power source. Turn your charger ON only when it is connected to the vehicle and plugged into a 3-prong grounded wall outlet.

Battery Voltage Select
When charging, testing or starting 12 volt systems, select 12 VOLT. Select 6 VOLT when charging, testing or starting 6 volt systems.

Touch-Pad Controls
With your charger connected to the vehicle and power source, the battery voltage (6 or 12 volt) selected, and the power turned ON, select either AUTOMATIC or MANUAL charge and the rate at which you want to charge your battery (2, 20, or 60 amp).

- **AUTO (Automatic):** When first turned ON, the charger will be in the Manual mode. To activate automatic charging, touch the AUTO pad and then select either the 2, 20, or 60 AMP Charge Rate Selector pad. Charging will start after a short delay. It will stop when the battery is fully charged. While charging, the METER will show battery voltage. Touch the VOLTS/AMPS pad to see the amount of amps being drawn by the battery.

- **MANUAL:** When first turned on, the charger will be in the Manual mode - there will be no need to select MANUAL. Select a charge rate and time. The charger will start charging after a short delay. **It will stop charging only when the selected time or maximum time is up.** For this reason, it is IMPORTANT to check the charger frequently to avoid overcharging the battery. Not doing so may cause damage to your battery or may cause other personal property damage or injury. While charging, the METER will show battery voltage. To see how much of the selected charge time is remaining, touch the TIME pad. The METER will show the time and, after a short delay, return to showing voltage. To see the amount of amps being drawn by the battery, touch the VOLTS/AMPS pad.
- **TIME:** To select a charging time, you must be in the MANUAL mode and have selected a charge rate. Touch the TIME pad until the desired time shows on the meter. The chart on page 10 shows the amount of time available for each charge rate and the amount of time, in hours, added for each touch of the TIME pad.

If you do not set a time, the charger will run for the maximum time. After selecting the charge rate and proper time, the charger will start charging after a short delay. To see how much time remains during the charging process, touch the TIME pad.

- **RESET:** To stop charging or to change settings once charging has begun, touch the RESET pad. Then proceed as if you've just turned on the charger.
- **VOLT/AMP:** When the charger is turned on, the METER will display battery voltage. Touch the VOLTS/AMPS pad to display the charge rate in amps.
- **TESTER:** To check the battery's state-of-charge during charging, touch the RESET pad and then the TESTER pad. The METER will show the voltage of the battery. Wait about 5 minutes before taking a reading. **NOTE:** The tester interrupts the charging process. To continue charging, proceed as if you've just turned the charger ON.
- **ENGINE START:** To use the Engine Start feature to help crank the engine of your vehicle, touch RESET, MANUAL, and ENGINE START - in that order. Wait for the display to show RDY. The ENGINE START feature will deliver 275 amps to help crank a 12-volt system or 125 amps to help crank a 6-volt system. Crank the engine for **no more than 5 seconds.** If it does not start, **wait four minutes** before cranking again. During extremely cold weather, or if the battery is severely exhausted, charge the battery for about 5 minutes in the 60 AMP setting before cranking the engine.

IMPORTANT DO NOT try to crank an engine without a battery installed. You may damage the vehicle's electrical system. NOTE: If you have charged the battery and it still will not start your car, do not use the engine start feature, or it could damage the vehicle's electrical system.

- **DIGITAL METER:** The meter displays the following information:

—A—	Charge Rate in Amps
—V—	Battery Voltage
MAN	Charger is in Manual mode
AUTO	Charger is in Automatic mode
RDY	Charger is ready for cranking (Engine Start)
WAIT	Wait until the charger is ready before cranking again
FULL	Battery is charged (Automatic mode)
OFF	Time has expired (Manual or Timer mode)

HR Hour(s)

CHK BATT There is a problem with the battery or connections

OL Too high a charging rate; lower rate to continue

11. OPERATING INSTRUCTIONS

⚠WARNING This battery charger must be properly assembled in accordance with the assembly instructions before it is used.

Charging

1. Ensure that all of the charger components are in place and in good working condition, for example, the plastic boots on the battery clips.
2. Connect the battery following the precautions listed in sections 6 and 7.
3. Connect the AC power following the precautions listed in section 8.
4. Set the BATTERY switch to 6V or 12V to match the battery's voltage.
5. Turn the charger on.
6. Select the appropriate settings for your battery.

Using the Engine Start feature

Your battery charger can be used to jumpstart your car if the battery is low. Follow these instructions on how to use the ENGINE START feature.

⚠WARNING Follow all safety instructions and precautions for charging your battery. Wear complete eye protection and clothing protection. Charge your battery in a well-ventilated area.

IMPORTANT Using the ENGINE START feature WITHOUT a battery installed in the vehicle could cause damage to the vehicle's electrical system. NOTE: If you have charged the battery and it still will not start your car, do not use the engine start feature, or it could damage the vehicle's electrical system.

1. Set the POWER switch to the OFF position. Then connect the charger to the battery following the instructions given in section 6 (FOLLOW THESE STEPS WHEN THE BATTERY IS INSTALLED IN A VEHICLE).
2. Set the BATTERY switch to 6V or 12V to match the battery's voltage.
3. Set the POWER switch to the ON position. The METER display will show MAN (manual mode).
4. Touch RESET, MANUAL and ENGINE START pads in that order. Wait for the display to show RDY. The charger is now ready to have the engine cranked.
5. Crank the engine until it starts or 5 seconds pass. If the engine does not start, wait 4 minutes before cranking again. (The display will show WAIT during this time and RDY when the time is up.) This allows the charger and battery to cool down.

NOTE: During extremely cold weather, or if the battery is under 2 volts, charge the battery for 5 minutes before cranking the engine.

6. If the engine fails to start, charge the battery for 5 more minutes before attempting to crank the engine again.
7. After the engine starts, move the POWER switch to the OFF position and unplug the AC power cord before disconnecting the battery clips from the vehicle.
8. Clean and store the charger in a dry location.

NOTE: If the engine does turn over but never starts, there is not a problem with the starting system; there is a problem somewhere else with the vehicle. STOP cranking the engine until the other problem has been diagnosed and corrected.

NOTE: The GFCI outlet should not be used while the Charger is in the Engine Start Mode.

Using The GFCI outlets

This unit includes two – GFCI (Ground Fault Circuit Interrupter) outlets located on the back of the charger. The purpose of a GFCI outlet is to quickly stop the flow of electricity in the event a ground fault occurs on the device plugged into the GFCI outlet.

The power cord must be plugged into a 3-prong grounded 120V AC wall outlet for the GFCI operation to function. Ground fault circuit interrupters (GFCI) can help prevent electrical shock or electrocution.

The GFCI outlets provide auxiliary power to 120V AC devices that require less than 15 amps.

The GFCI outlet must be tested each time before it is used. To test:

1. First, push the RESET button located on the GFCI receptacle to assure normal GFCI operation.
2. Plug a night light (with an ON/OFF switch) or other product (such as a lamp) into the GFCI receptacle and turn the product on.
3. Push the TEST button located on the GFCI receptacle. The night light or other product should go off.
4. Push the RESET button. The night light or other product should go on.

⚠WARNING If the night light or other product remains on when the TEST button is pushed, the GFCI outlet is not working properly and should not be used. Call Customer service at 1-800-732-7764.

- If you are charging a battery, the GFCI outlets should be limited to 3 amps of current draw until the charging functions are complete.
- The GFCI outlets should not be used while the charger is in the ENGINE START Mode.
- If using both GFCI outlets at the same time, the amperage cannot exceed 15 amps for both devices combined.

General Charging Notes

Fan: It is normal for the charger's fan to be on all the time. Keep the area near the charger clear of obstructions to allow the fan to operate efficiently.

Voltage: The voltage displayed during charging is the charging voltage and is usually higher than the battery's resting voltage.

12. CALCULATING CHARGE TIME

Use the following table to more accurately determine the time it will take to bring a battery to full charge. First, identify where your battery fits into the chart.

NR means that the charger setting is NOT RECOMMENDED.

Find your battery's rating on the chart below, and note the charge time given for each charger setting. The times given are for batteries with a 50% charge prior to recharging. Add more time for severely discharged batteries.

BATTERY SIZE/RATING			CHARGE RATE/CHARGING TIME		
			2 AMP	20 AMP	60 AMP
SMALL BATTERIES	Motorcycle, garden, tractor, etc.	6 - 12 AH	2 - 4 hrs	NR	NR
		12 - 32 AH	4 - 10 hrs	NR	NR
CARS/TRUCKS	200 - 315 CCA	40 - 60 RC	11 ¼ - 14 ½ hrs	60 - 90 min.	20 - 30 min.
	315 - 550 CCA	60 - 85 RC	14 ½ - 18 ¼ hrs	90 - 120 min.	30 - 40 min.
	550 - 1000 CCA	80 - 190 RC	18 ¼ - 34 ¾ hrs	2 - 3.5 hrs.	45 - 60 min.
MARINE/DEEP CYCLE		80 RC	17 ½ hrs	105 min.	NR
		140 RC	27 hrs	2 hrs., 45 min.	NR
		160 RC	30 hrs	3 hrs.	NR
		180 RC	33 hrs	3.5 hrs.	NR

13. MAINTENANCE INSTRUCTIONS

13.1 After use and before performing maintenance, unplug and disconnect the battery charger (see sections 6, 7 and 8).

13.2 Use a dry cloth to wipe all battery corrosion and other dirt or oil from the battery clips, cords, and the charger case.

13.3 Ensure that all of the charger components are in place and in good working condition, for example, the plastic boots on the battery clips.

13.4 Servicing does not require opening the unit, as there are no user-serviceable parts.

13.5 All other servicing should be performed by qualified service personal.

14. MOVING AND STORAGE INSTRUCTIONS

14.1 Store the charger unplugged, in an upright position. The cord will still conduct electricity until it is unplugged from the outlet.

14.2 Store inside, in a cool, dry place.

14.3 Do not store the clips on the handle, clipped together, on or around metal, or clipped to cables.

14.4 If the charger is moved around the shop or transported to another location, take care to avoid/prevent damage to the cords, clips and charger. Failure to do so could result in personal injury or property damage.

15. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REASON/SOLUTION
Ammeter reading stays high.	Battery is severely discharged.	Continue charging battery for two more hours. If problem continues have the battery checked.
	Wrong battery voltage.	Verify that the voltage settings on the charger are correct.
Ammeter reads less than selected charge rate when charging a discharged battery.	Extension cord is too long or wire gauge is too small.	Use a shorter or heavier gauge extension cord.
	Weak cell or sulfated plate in battery.	A sulfated battery will eventually take a normal charge if left connected. If the battery will not take a charge, have it checked.
	Battery is only partially discharged.	Continue to charge the battery.
The charger is making an audible clicking sound.	Circuit breaker is cycling.	The settings may be wrong. Check the charger settings.
	Battery is defective.	Have the battery checked.
	Shorted battery cables or clips.	Circuit breaker cycles when current draw is too high. Check for shorted cables or clips and replace if necessary.
	Severely discharged battery, but otherwise it is a good battery.	The battery may not want to accept a charge due to a run-down state. Allow charging to continue until battery has a chance to recover sufficiently to take a charge. If more than 20 minutes, stop charging and have the battery checked.
	Reverse connections at battery.	Shut the charger off and correct the lead connections.
Charger makes a loud buzz or hum.	Transformer laminations vibrate (buzz).	No problem, this is a normal condition.
	Shorted Diode Assembly or Output Rectifier Assembly (hum).	Have charger checked by a qualified technician.

PROBLEM	POSSIBLE CAUSE	REASON/SOLUTION
Short or no start cycle when cranking engine.	Drawing more than the Engine Start rate.	Crank time varies with the amount of current drawn. If cranking draws more than the Engine Start rate, crank time may be less than 5 seconds.
	Failure to wait 4 minutes between cranks.	Wait 4 minutes of rest time before the next crank.
	Clips are not making a good connection.	Check for poor connection at battery and frame.
	AC cord and/or extension cord is loose.	Check power cord and extension cord for loose fitting plug.
	No power at receptacle.	Check for open fuse or circuit breaker supplying AC outlet.
	The charger may be overheated.	The thermal protector may have tripped and needs a little longer to reset. Make sure the charger vents are not blocked. Wait and try again.
	Battery may be severely discharged.	On a severely discharged battery, charge for 10 to 15 minutes in the manual charge rate to help assist in cranking.
Charger will not turn on when properly connected.	AC outlet is dead.	Check for open fuse or circuit breaker supplying AC outlet.
	Poor electrical connection.	Check power cord and extension cord for loose fitting plug.
The measured current is much lower than what was selected.	The charger reached the maximum voltage and is reducing the current.	No problem, this is a normal condition.

16. BEFORE RETURNING FOR REPAIRS

16.1 When a charging problem arises, make certain that the battery is capable of accepting a normal charge. Double check all connections, the AC outlet for a full 120 volts, the charger clips for correct polarity and the quality of the connections from the cables to the clips and from the clips to the battery system. The clips must be clean.

16.2 When a battery is very cold, partially charged or sulfated, it will not draw the full rated amperes from the charger. It is both dangerous and damaging to a battery to force higher amperage into it than it can effectively use in recharging.

16.3 When an UNKNOWN OPERATING PROBLEM arises, please read this complete manual and call the customer service number for information that will usually eliminate the need for return.

If the above solutions do not eliminate the problem, or for information about troubleshooting or replacement parts, call toll-free from anywhere in the U.S.A.
1-800-732-7764
7:00 am to 5:00 pm Central Time Monday through Friday